

St. Onge Steward Johnston & Reens LLC



986 Bedford Street
Stamford Connecticut 06905-5619
(203) 324 6155
(203) 327 1096
ssjr.com

FAX COVER SHEET

DATE

April 29, 2008

PAGES

9

DELIVER TO

United States Patent Office
Attn: Kaj K. Olsen

Appl. No.

10/029,659
Art Unit: 1795

FAX NUMBER

571-273-1344

SSJR FILE

03141-P0380A

FROM

Jadira N. De La Torre for
David Chen

New York (212) 730 4554
New Haven (203) 562 0400

Dry Nafion for prevention of flooding in electrochemical sensors

A. Description of Invention:

Conventionally, Nafion, a solid polymer electrolyte, used in fabrication of electrochemical sensors is cleaned extensively in boiling water to remove impurities. Electrochemical sensors for gases, employing planar design, are assembled using wet Nafion. The electrochemical sensor assembled with wet Nafion leads to covering of electrode surface with liquid droplets and result in lower sensitivity of sensor after assembly; the sensor needs to be flushed with dry gas in order to regain its response. Also, the assembly process, which involves wet parts, is cumbersome and less reproducible. In this invention, it is proposed to assemble the electrochemical sensor with dry Nafion. In this case, the sensors are not flooded from the very beginning and only a few hours of storage time are required after assembly to wet the Nafion. Therefore, the sensor will be operational within a few hours of assembly to its full potential.

B. Purpose and Advantages:

The electrochemical sensor does not need to be purged with air for a day and the assembly process is less cumbersome. The required start up time for such a sensor after placement into the measurement instrument is only a few minutes, until the full response to the analyte gas is reached.

C. Impact on Company Business:

The proposed design will be used in hand-held instruments. The use of dry Nafion will reduce assembly time, cost, and start up time of the sensor.

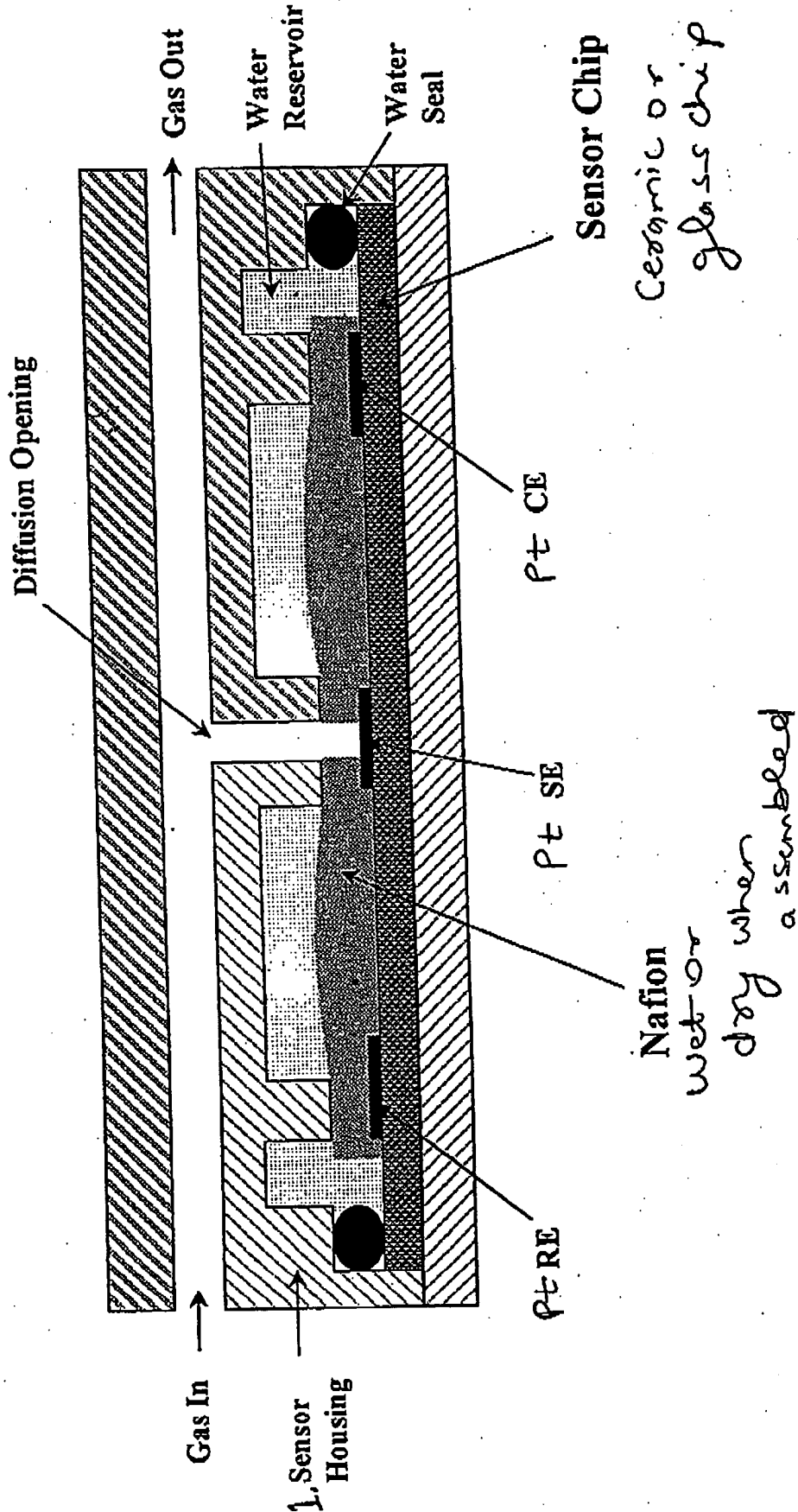
D. Prior Art:

Electrochemical sensors use wet Nafion for assembly. The use of wet Nafion is cumbersome for manufacturing. The sensors, assembled with wet Nafion, need to be purged with dry gas for more than 20 hours after placed in the measurement instrument, in order to stabilize the sensor response before it is ready for use..

Invention detail:

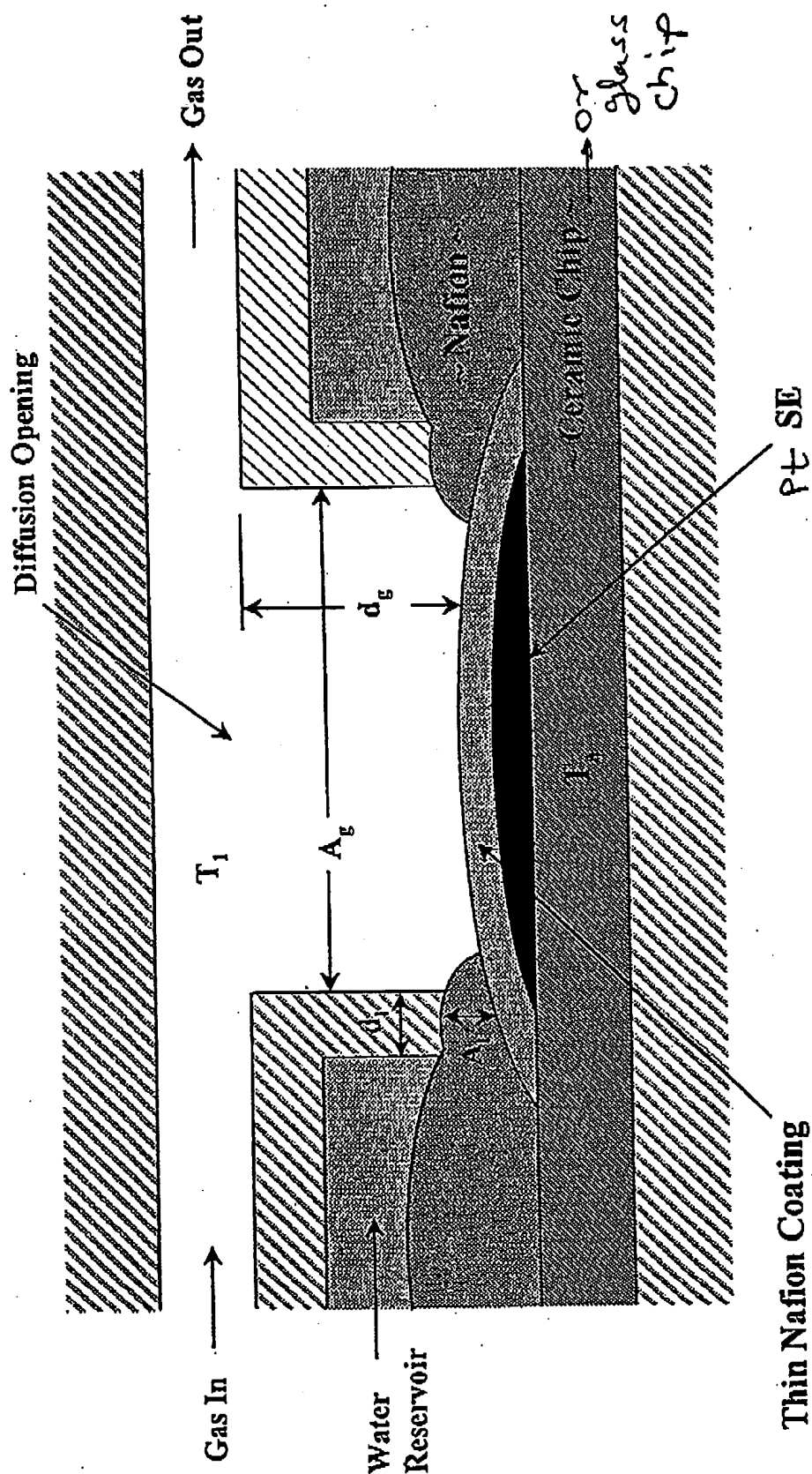
The Electrochemical sensors are assembled with dry Nafion. The enclosed graphs show that the sensor prepared with dry Nafion respond within two minutes to 90% of a stable response which is reached within a few hours of assembly.

Electrochemical Sensor Housing



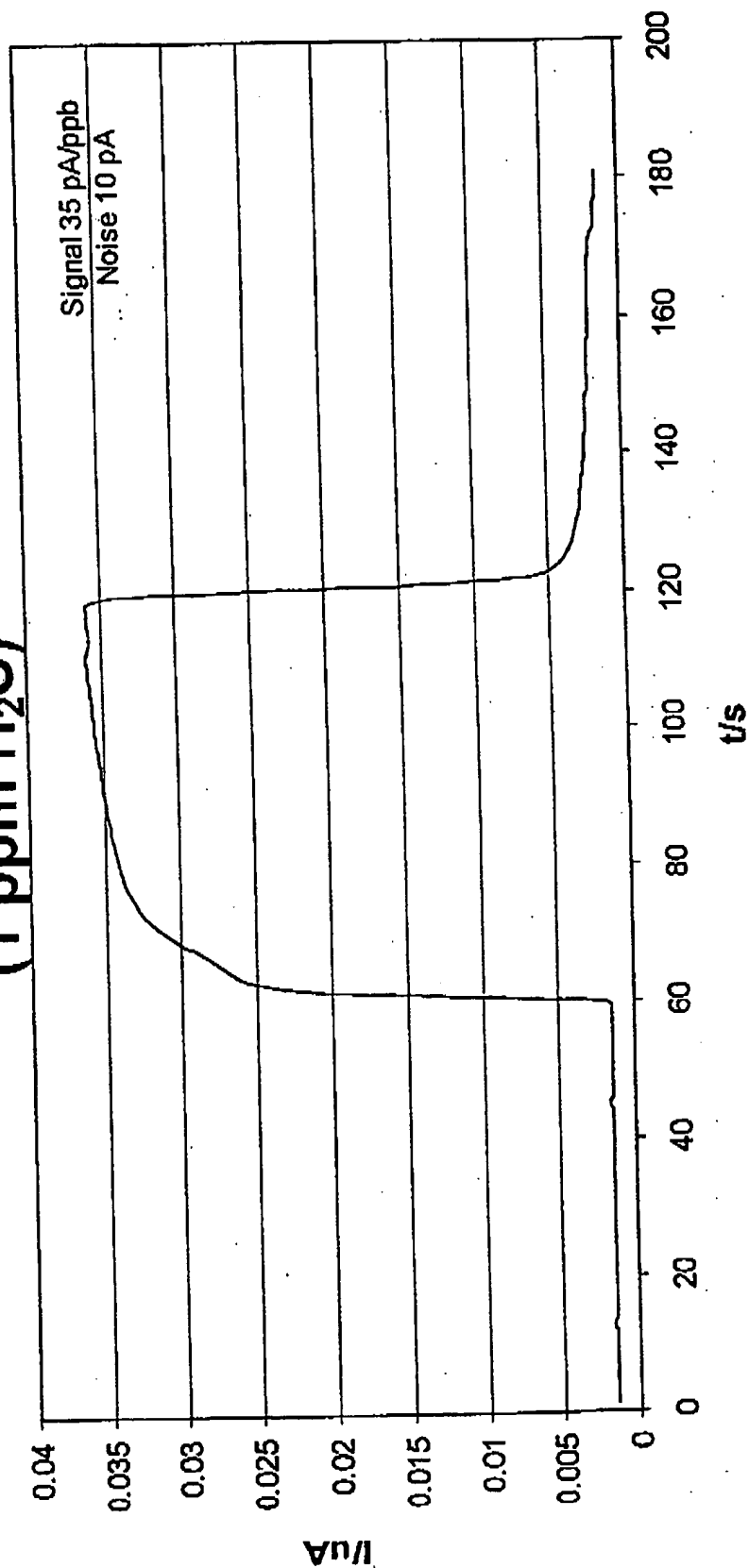
PERKIN ELMER

Electrochemical Sensor



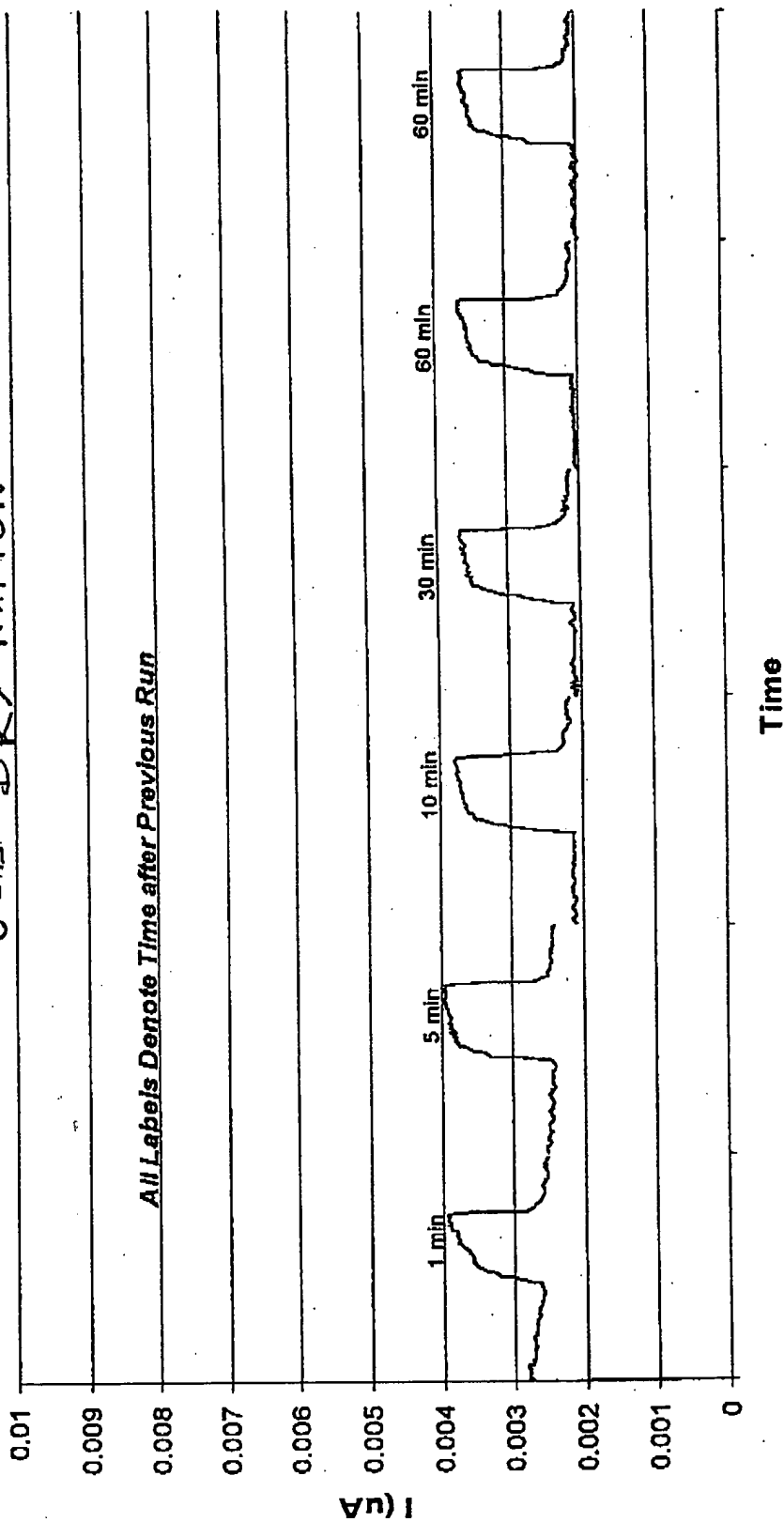
Sensor Assembled with Dry Nafion

(1 ppm H₂S)

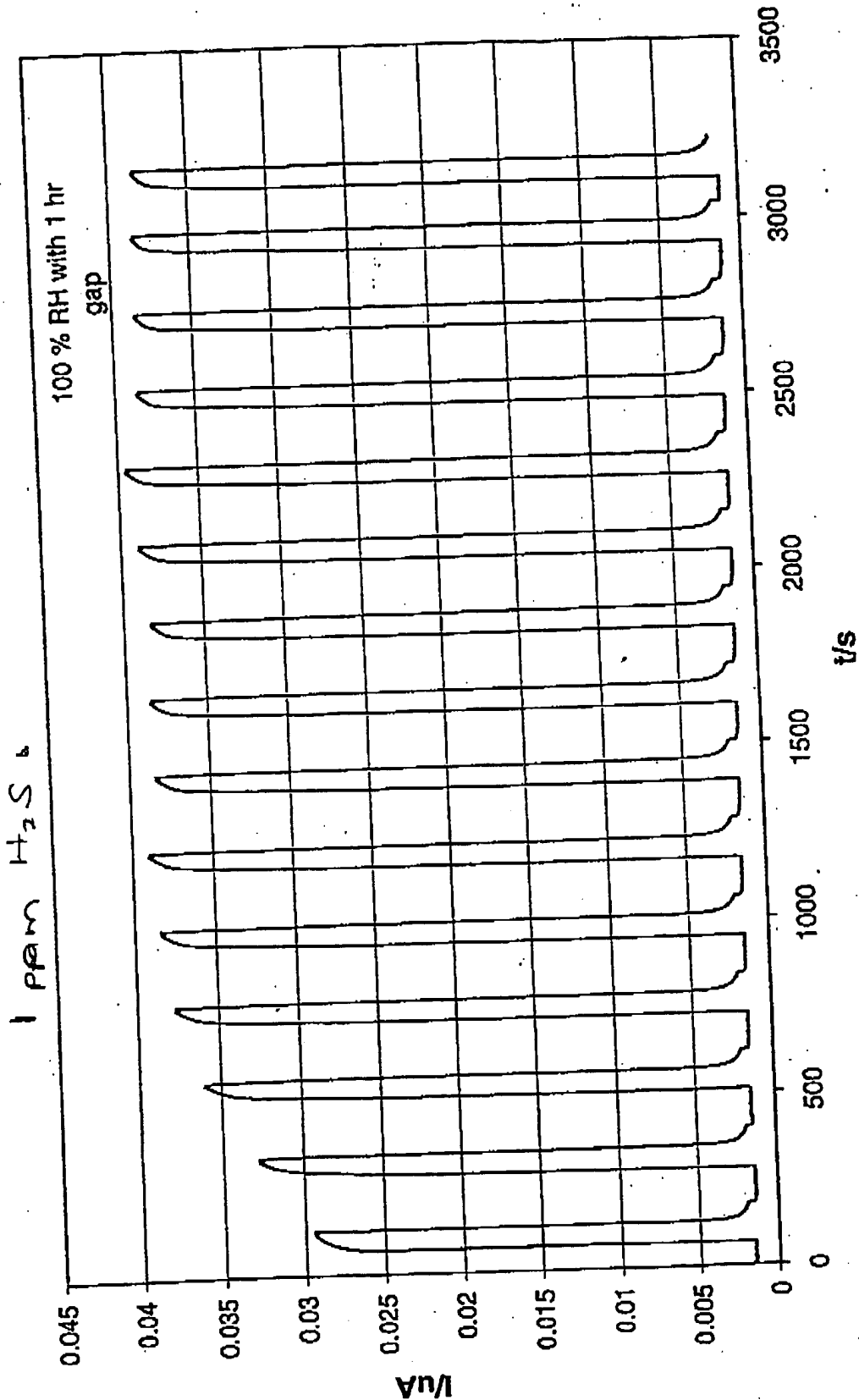


Thin Film Sensor Stabilization Time (100 ppb H₂S)

USES DRY NAFION



Sensor Assembled with Dry Nafion



341-P0380A

PAGE 1 OF



INVENTION DISCLOSURE

Docket No.

5023-ECS

1. TITLE OF INVENTION

ELECTROCHEMICAL SENSOR WITH DRY NATION

2. INVENTOR(S)

| | | |
|-------------------------------------|---------------------------------|--|
| FULL LEGAL NAME AVINASH DALMIA | COUNTRY OF CITIZENSHIP INDIA | CITY, COUNTRY OF RESIDENCE DANBURY, CT, USA |
| FULL LEGAL NAME OTTO J. PROHASKA | COUNTRY OF CITIZENSHIP USA | CITY, COUNTRY OF RESIDENCE DANBURY, CT |

3. PROOF OF CONCEPTION

| | | |
|--|-----------------|--|
| WHO FIRST MADE THE DRAWING? OTTO PROHASKA | DATE 03/2000 | LOCATION OF FIRST DRAWING OFFICE / WILTON |
| WHO FIRST WROTE THE DESCRIPTION? AVINASH DALMIA | DATE 03/2000 | LOCATION OF FIRST DESCRIPTION OFFICE / WILTON |
| TO WHOM WAS THE INVENTION FIRST DISCLOSED? DAVE CRACY | DATE 03/2000 | |

4. REDUCTION TO PRACTICE

| | |
|--|--|
| WAS A DEVICE EMBODYING THE INVENTION CONSTRUCTED AND TESTED OR PROCESS PRACTICED? | YES <input checked="" type="checkbox"/> NO |
| BY WHOM? AVINASH DALMIA | DATE COMPLETED 06/2000 |
| PRESENT LOCATION OF DEVICE ECS LAB IN WILTON | |
| PRESENT LOCATION OF DOCUMENTS (DATE SIGNED AND WITNESSES), INCLUDING PHOTOS, DRAWINGS AND DATA SHEET, SHOWING REDUCTION TO PRACTICE WILTON OFFICE | |

NOTE: ALL EVIDENCE OF CONCEPTION (FIRST DRAWING AND FIRST WRITTEN DESCRIPTION) AND EVIDENCE OF REDUCTION TO PRACTICE (DEVICE EMBODYING THE INVENTION AND TEST DATA) MUST BE RETAINED.

PROPRIETARY INFORMATION

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION. EXCEPT WITH WRITTEN PERMISSION OF PERKINELMER INC., SUCH INFORMATION SHALL NOT BE PUBLISHED OR DISCLOSED TO OTHERS, OR USED FOR ANY PURPOSE. THESE DOCUMENTS SHALL NOT BE DUPLICATED IN WHOLE OR IN PART. THIS LEGEND SHALL BE APPLIED TO ALL DOCUMENTS CONTAINING THIS INFORMATION.

SIGNATURE OF INVENTOR

SIGNATURE OF INVENTOR

DATE

DATE

READ AND UNDERSTOOD BY:

WITNESS NAME (TYPE)

WITNESS SIGNATURE

DATE

WITNESS NAME (TYPE)

WITNESS SIGNATURE

DATE

(EACH PAGE UPON WHICH INFORMATION IS ENTERED SHOULD BE SIGNED AND WITNESSED)

INVENTION DISCLOSURE

PAGE 2 OF

5. RELATED DOCUMENTS

| | |
|--|--|
| IS THERE A PUBLICATION RELATED TO THE INVENTION? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | IF YES, NAME OF PUBLICATION |
| ARE THERE ANY RELATED INVENTION DISCLOSURES OR PATENT APPLICATIONS? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> | IF YES, IDENTIFY THE DISCLOSURES OR APPLICATIONS PREVENTION OF FLOODING IN THICK-FILM ELECTROCHEMICAL SENSORS |
| ARE THERE ANY PROPOSALS OR REPORTS OR OTHER DOCUMENTS RELATING TO THIS INVENTION? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | IF YES, PLEASE DESCRIBE |

6. SALE

| | | |
|--|------------|---------------|
| HAS A PRODUCT EMBODYING THE INVENTION BEEN OFFERED FOR SALE? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | ORDER DATE | DELIVERY DATE |
| DATE OFFERED | CUSTOMER | |

7. DESCRIPTION OF THE INVENTION

PLEASE ADDRESS THE FOLLOWING QUESTIONS ON ADDITIONAL SHEETS. BE SURE THAT EACH ADDITIONAL PAGE IS DATED AND SIGNED BY EACH INVENTOR AND TWO WITNESSES.

- GIVE A BRIEF DESCRIPTION OF YOUR INVENTION, PARTICULARLY POINTING OUT WHAT IS BELIEVED TO BE NOVEL (THE "HEART" OF WHAT IS NEW)
- EXPLAIN THE PURPOSE AND ADVANTAGES OF YOUR INVENTION (WHAT WILL THE INVENTION DO BETTER THAN HAS BEEN DONE PREVIOUSLY?)
- STATE THE IMPACT OF YOUR INVENTION ON COMPANY BUSINESS, PRODUCT LINES, POTENTIAL COMMERCIAL APPLICATIONS OR USE BY OTHERS. FEEL FREE TO INCLUDE OTHER INFORMATION WHICH YOU THINK MAY HELP THE INVENTION EVALUATION COMMITTEE DECIDE WHETHER A PATENT APPLICATION SHOULD BE FILED.
- IDENTIFY THE MOST SIMILAR PRIOR ART KNOWN TO YOU WHICH YOUR INVENTION HAS IMPROVED UPON OR DISPLACED. STATE IN DETAIL, IF KNOWN, THE DISADVANTAGES OF SUCH PRIOR ART.
- DESCRIBE IN DETAIL HOW YOUR INVENTION IS MADE AND HOW IT OPERATES. ATTACH PRINTS OF DRAWINGS OR SKETCHES HELPFUL IN UNDERSTANDING HOW YOUR INVENTION WORKS. IF YOUR INVENTION HAS BEEN TESTED, BRIEFLY SUMMARIZE THE TEST RESULTS WHICH CONFIRM THE FUNCTIONS AND ADVANTAGES LISTED ABOVE

PROPRIETARY INFORMATION

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION. EXCEPT WITH WRITTEN PERMISSION OF PERKINELMER INC., SUCH INFORMATION SHALL NOT BE PUBLISHED OR DISCLOSED TO OTHERS, OR USED FOR ANY PURPOSE. THESE DOCUMENTS SHALL NOT BE DUPLICATED IN WHOLE OR IN PART. THIS LEGEND SHALL BE APPLIED TO ALL DOCUMENTS CONTAINING THIS INFORMATION.

[Signature]
SIGNATURE OF INVENTOR

[Signature]
SIGNATURE OF INVENTOR

06/22/00
DATE

06/22/00
DATE

READ AND UNDERSTOOD BY:

WITNESS NAME (TYPE)

WITNESS SIGNATURE

DATE

WITNESS NAME (TYPE)

WITNESS SIGNATURE

DATE

(EACH PAGE UPON WHICH INFORMATION IS ENTERED SHOULD BE SIGNED AND WITNESSED)